

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) An ink jet recording apparatus which includes an ink jet head whose recording-medium opposing surface that opposes a recording surface of a recording medium is furnished with an ink ejecting portion formed with open ends of a plurality of nozzle holes for ejecting a UV curable ink, and a head moving mechanism for putting the ink jet head into reciprocating motion in a predetermined direction parallel to the recording surface of the recording medium, and which performs recording by ejecting the ink from the nozzle holes of the ink jet head onto the recording surface of the recording medium and then curing the ink ejected and attached onto the recording surface of the recording medium by irradiation with ultraviolet light, at least when the head moving mechanism puts the ink jet head into a forward motion of the reciprocating motion,

wherein the ink jet head or a moving member which moves together with the ink jet head is provided with a plurality of ultraviolet light emitting diodes for emitting the ultraviolet

light to the ink attached onto the recording surface of the recording medium to cure the ink,

wherein the apparatus is configured so that the ultraviolet light emitted from the ultraviolet light emitting diodes is applied via a transparent light guiding member to the ink attached to the recording medium.

2. (Cancelled)

3. (Cancelled)

4. (Currently Amended) The ink jet recording apparatus of claim 3, wherein each ultraviolet light emitting diode in each ultraviolet-light-emitting-diode row is disposed in a position corresponding to the middle position between two adjacent ultraviolet light emitting diodes arranged in a neighboring one of the ultraviolet-light-emitting-diode rows, so that the ultraviolet light emitting diodes in the two adjoining ultraviolet-light-emitting-diode rows form a zigzag pattern.

5. (Currently Amended) ~~The ink jet recording apparatus of claim 2,~~ An ink jet recording apparatus which includes an ink jet head whose recording-medium opposing surface that opposes a recording surface of a recording medium is furnished with an ink ejecting portion formed with open ends of a plurality of nozzle holes for ejecting a UV curable ink, and a head moving

mechanism for putting the ink jet head into reciprocating motion in a predetermined direction parallel to the recording surface of the recording medium, and which performs recording by ejecting the ink from the nozzle holes of the ink jet head onto the recording surface of the recording medium and then curing the ink ejected and attached onto the recording surface of the recording medium by irradiation with ultraviolet light, at least when the head moving mechanism puts the ink jet head into a forward motion of the reciprocating motion,

wherein the ink jet head or a moving member which moves together with the ink jet head is provided with a plurality of ultraviolet light emitting diodes for emitting the ultraviolet light to the ink attached onto the recording surface of the recording medium to cure the ink, wherein the ultraviolet light emitting diodes, when seen from a direction perpendicular to the recording surface of the recording medium, are arranged to form one or a plurality of linear rows that extend in a direction perpendicular to the direction of the reciprocating motion of the ink jet head; and

wherein the open ends of the nozzle holes are arranged in the ink ejecting portion to form at least one or a plurality of linear rows that extend in a direction perpendicular to the direction of the reciprocating motion of the ink jet head, and the number of the ultraviolet light emitting diodes arranged in each ultraviolet-light-emitting-diode row is smaller than the number of the

nozzle hole open ends existing in each nozzle-hole-open-end row.

6. (Currently Amended) The ink jet recording apparatus of claim 2 5, wherein ~~the open ends of the nozzle holes are arranged in the ink ejecting portion to form at least one or a plurality of linear rows that extend in a direction perpendicular to the direction of the reciprocating motion of the ink jet head, and~~ the ultraviolet light emitting diodes existing on both ends of each ultraviolet-light-emitting-diode row are positioned outwardly of the nozzle hole open ends existing on both ends of each nozzle-hole-open-end row with respect to the direction of the nozzle-hole-open-end row.

7. (Currently Amended) ~~The ink jet recording apparatus of claim 2, An ink jet recording apparatus which includes an ink jet head whose recording-medium opposing surface that opposes~~ a recording surface of a recording medium is furnished with an ink ejecting portion formed with open ends of a plurality of nozzle holes for ejecting a UV curable ink, and a head moving mechanism for putting the ink jet head into reciprocating motion in a predetermined direction parallel to the recording surface of the recording medium, and which performs recording by ejecting the ink from the nozzle holes of the ink jet head onto the recording surface of the recording medium and then curing the ink ejected and attached onto the recording surface of the

recording medium by irradiation with ultraviolet light, at least when the head moving mechanism
puts the ink jet head into a forward motion of the reciprocating motion,

wherein the ink jet head or a moving member which moves together with the ink jet head
is provided with a plurality of ultraviolet light emitting diodes for emitting the ultraviolet light to
the ink attached onto the recording surface of the recording medium to cure the ink,

wherein the ultraviolet light emitting diodes, when seen from a direction perpendicular to
the recording surface of the recording medium, are arranged to form one or a plurality of linear
rows that extend in a direction perpendicular to the direction of the reciprocating motion of the
ink jet head; and

wherein the length, in the direction of the ultraviolet-light-emitting-diode rows, of a
portion of the recording surface of the recording medium on which recording is performed in a
single forward motion of the ink jet head is smaller than the length, in the direction of the
ultraviolet-light-emitting-diode rows, of a portion of the recording surface of the recording
medium which can be irradiated with ultraviolet light emitted from all of the ultraviolet light
emitting diodes during the single forward motion.

8. (Currently Amended) The ink jet recording apparatus of claim 2 7, wherein a pattern
mask is provided between the ultraviolet light emitting diodes and the recording medium so as to

reduce difference in illumination of ultraviolet light on the recording surface of the recording medium between a portion of the recording surface which corresponds to the middle position between any two adjacent ultraviolet light emitting diodes in each ultraviolet-light-emitting-diode row and portions of the recording surface which correspond to the positions of those two ultraviolet light emitting diodes.

9. (Cancelled)

10. (Previously Presented) The ink jet recording apparatus of claim 1, wherein the apparatus is configured so that each time the ink jet head performs a forward motion and a backward motion of the reciprocating motion, the ink is ejected from the nozzle holes of the ink jet head onto the recording surface of the recording medium so as to perform recording, and the ultraviolet light emitting diodes are disposed at both sides of the ink ejecting portion with respect to the direction of the reciprocating motion of the ink jet head.

11. (Previously Presented) The ink jet recording apparatus of claim 10, wherein the apparatus is configured so that in each of the forward and backward motions of the ink jet head, at least the ultraviolet light emitting diodes rearward of the ink ejecting portion with respect to the moving direction of the ink jet head emit the ultraviolet light.

12. (Previously Presented) The ink jet recording apparatus of claim 1, wherein the

apparatus is configured so that only when the ink jet head performs a forward motion of the reciprocating motion, the ink is ejected from the nozzle holes of the ink jet head onto the recording surface of the recording medium so as to perform recording, and

the ultraviolet light emitting diodes are disposed rearward of the ink ejecting portion with respect to the direction of the forward motion of the ink jet head.

13. (Previously Presented) The ink jet recording apparatus of claim 1, wherein the nozzle holes are formed in a nozzle plate which forms the recording medium opposing surface of the ink jet head, and

the ultraviolet light emitting diodes are disposed on the nozzle plate.

14. (Previously Presented) The ink jet recording apparatus of claim 1, wherein the nozzle holes are formed in a nozzle plate which forms the recording medium opposing surface of the ink jet head, and

the ultraviolet light emitting diodes are disposed on a member other than the nozzle plate.

15. (Previously Presented) The ink jet recording apparatus of claim 1, wherein the apparatus is configured so that the ultraviolet light emitting diodes are placed in a case and that the ultraviolet light is emitted through a surface of the case.

16. (Previously Presented) The ink jet recording apparatus of claim 15, wherein the case

is disposed so that the ultraviolet light emitting surface thereof is in the same plane as the recording medium opposing surface of the ink jet head.

17. (Previously Presented) The ink jet recording apparatus of claim 15, wherein the case is disposed so that the ultraviolet light emitting surface thereof is located closer to the recording medium than the recording medium opposing surface of the ink jet head is.

18. (Previously Presented) The ink jet recording apparatus of claim 15, wherein the case is disposed so that the ultraviolet light emitting surface thereof is located farther from the recording medium than the recording medium opposing surface of the ink jet head is.

19. (Previously Presented) The ink jet recording apparatus of claim 15, wherein the case is disposed at least rearward of the ink ejecting portion with respect to the direction of the forward motion of the ink jet head, and

the ultraviolet light emitting surface of the case is tilted with respect to the recording medium opposing surface of the ink jet head so that the side of the ultraviolet light emitting surface closer to the ink ejecting portion is located closer to the recording medium than the opposite side of the case is.

20. (Previously Presented) The ink jet recording apparatus of claim 15, wherein the case

is disposed at least rearward of the ink ejecting portion with respect to the direction of the forward motion of the ink jet head, and

a light blocking member for preventing part of the ultraviolet light emitted by the ultraviolet light emitting diodes from reaching the ink ejecting portion is provided between the case and the ink ejecting portion.

21. (Previously Presented) The ink jet recording apparatus of claim 1, wherein a heat conduction member for conducting, to the ink within the ink jet head, heat produced by the emission by the ultraviolet light emitting diodes is provided.

22. (Previously Presented) The ink jet recording apparatus of claim 1, wherein a radiator for dissipating heat produced by the emission by the ultraviolet light emitting diodes is provided.

23 - 51. (Cancelled)

52. (New) An ink jet recording apparatus to perform recording by ejecting an UV curable ink onto a recording surface of a recording medium comprising:

an ink jet head having a recording medium opposing surface that opposes the recording surface of the recording medium, the recording medium opposing surface including a plurality of nozzle holes to eject a UV curable ink on the recording surface of the recording medium;

a carriage configured to put the ink jet head into reciprocating motion in a first direction parallel to the recording surface of the recording medium, the nozzle holes being arranged to form one or a plurality of linear ink holes rows that extend in a second direction perpendicular to the first direction; and

a plurality of ultraviolet light emitting diodes configured to emit ultraviolet light to the UV curable ink ejected onto the recording surface of the recording medium to cure the UV curable ink, the ultraviolet light emitting diodes being arranged to form one or a plurality of linear ultraviolet light emitting diode rows that extend in the second direction, wherein the number of the ultraviolet light emitting diodes in each of the linear ultraviolet light emitting diode rows is smaller than the number of nozzle holes in each of the nozzle holes rows.

53. (New) The ink jet apparatus according to claim 52, wherein each ultraviolet emitting diode in each of the linear ultraviolet light emitting diode rows is disposed in a position corresponding to a middle position between two adjacent ultraviolet light emitting diodes arranged in a neighboring one of the plurality of the linear ultraviolet light emitting diode rows,

so that the ultraviolet light emitting diodes in the two adjoining linear ultraviolet light emitting diode rows form a zigzag pattern.

54. (New) The ink jet recording apparatus according to claim 52, wherein the ultraviolet light emitting diodes existing on both ends of each of the linear ultraviolet light emitting diode rows are positioned outwardly of the nozzle holes existing on both ends of each of the linear nozzle holes rows with respect to the second direction.

55. (New) An ink jet recording apparatus to perform recording by ejecting an UV curable ink onto a recording surface of a recording medium comprising:

an ink jet head having a recording medium opposing surface that opposes the recording surface of the recording medium, the recording medium opposing surface including a plurality of nozzle holes to eject a UV curable ink on the recording surface of the recording medium;

a carriage configured to put the ink jet head into reciprocating motion in a first direction parallel to the recording surface of the recording medium, the nozzle holes being arranged to form one or a plurality of linear ink holes rows that extend in a second direction perpendicular to the first direction; and

a plurality of ultraviolet light emitting diodes configured to emit ultraviolet light to the UV curable ink ejected onto the recording surface of the recording medium to cure the UV curable ink, the ultraviolet light emitting diodes being arranged to form one or a plurality of linear ultraviolet light emitting diode rows that extend in the second direction, wherein a length, in the second direction, of a first area onto which the nozzle holes eject the UV curable ink during a single forward motion of the ink jet head by the carriage is smaller than a length in the second direction, of a second area onto which the ultraviolet light emitting diodes emit the ultraviolet light during the single forward motion.

56. (New) An ink jet recording apparatus to perform recording by ejecting an UV curable ink onto a recording surface of a recording medium comprising:

an ink jet head having a recording medium opposing surface that opposes the recording surface of the recording medium, the recording medium opposing surface including a plurality of nozzle holes to eject UV curable ink on the recording surface of the recording medium;

a carriage configured to put the ink jet head into reciprocating motion in a first direction parallel to the recording surface of the recording medium, the nozzle holes being arranged to

form one or a plurality of linear ink holes rows that extend in a second direction perpendicular to the first direction;

a plurality of ultraviolet light emitting diodes configured to emit a ultraviolet light to the UV curable ink ejected onto the recording surface of the recording medium to cure the UV curable ink; and

a case configured to accommodate the plurality of ultraviolet light emitting diodes ~~and~~ having a transparent light transmitting surface to emit the ultraviolet light onto the recording surface of the recording medium.